

FORM PTO-1390
(REV 10-94)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

533 Rec'd PCT/PTO 05 SEP 2001

NAA-CAI-P25

U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.5)

09/936127

INTERNATIONAL APPLICATION NO.

PCT/JP00/01339

INTERNATIONAL FILING DATE

March 6, 2000

PRIORITY DATE CLAIMED

March 5, 1999

TITLE OF INVENTION

SYSTEM AND METHOD FOR CREATING FORMATTED DOCUMENT ON THE BASIS OF

APPLICANT(S) FOR DO/EO/US

CONVERSATIONAL SPEECH RECOGNITION

RYU, Tadimitsu

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau. (copy of Notice to Elected Office)
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
8. ☒ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 16. below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. ☒ A substitute specification. (same as English translation)
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information:

Copy of International Search Report by JPO

PCT/JP00/01339

CALCULATIONS PTO USE ONLY

REGISTRATION NUMBER

Leighton K. Chong
841 Bishop Street, Ste. 1200
Honolulu, HI 96813-3916

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
U.S. DESIGNATED OFFICE UNDER 35 U.S.C. 371

-----: Dkt.#: NAA-CAI-P25
In Re Patent Application Of:
:
RYU
:
Serial No.: (To Be Assigned)
:
Filed: (Concurrently Herewith)
:
Title: SYSTEM AND METHOD FOR CREATING
FORMATTED DOCUMENT ON THE BASIS
OF CONVERSATIONAL SPEECH RECOGNITION
-----: September 5, 2001

PRELIMINARY AMENDMENT

Commissioner of Patents
U.S. Patent & Trademark Office
Washington, D.C. 20231

Sir:

Pursuant to the filing of the above-identified patent application under 35 U.S.C. 371, please preliminarily amend the application as follows:

IN THE SPECIFICATION:

Please insert the following sentence after the Title: -

-This U.S. patent application claims the priority of PCT International Application No. PCT/JP00/01339, filed on March 6, 2000 based on the priority of Japanese Patent Application No. 58027/1999, filed on March 5, 1999, and Japanese Patent Application No. 58028/1999, filed on March 5, 1999.

09/936127

IN THE CLAIMS:

Please amend the claims, which were previously amended in the Amendment Under Article 19, as follows:

In Claim 8, lines 1-2, delete "the any of claim 1-7" and insert "--Claim 1--".

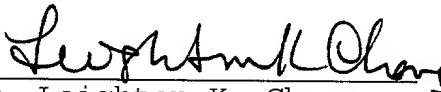
In Claim 16, lines 1-2, delete "wherein in the any of claim 9-15,".

REMARKS

The claims are amended to correct claim dependency form, and eliminate multiple dependency claims.

The total number of claims after amendment is 17, and number of independent claims after amendment is 2. These are within the numbers paid for with the filing of this application (small entity).

Respectfully submitted,
ATTORNEYS FOR APPLICANT


By: Leighton K. Chong
OSTRAGER CHONG & FLAHERTY (HAWAII)
841 Bishop Street, Suite 1200
Honolulu, HI 96813-3908
Tel: (808) 533-4300

FOIA b 7 - 229660

CLAIMS AS PRESENTED AFTER PRELIMINARY AMENDMENT

1. A formatted document creating system used for recording conversation comprising:
a speech recognition device for recognizing speech of conversation,
an information extracting section for extracting information to be recorded according to the results of speech recognition,
a conversation record buffer for transforming into formatted sentence including the extracted information and recording this as contents of conversation,
a case database for storing the above formatted sentence which may occur as the contents of conversation and includes many information,
a topicality control section for deducing an undefined information on the basis of one item of information included in the sentence recorded in the conversation record buffer section by referencing cases stored in the case database,
a multimodal interaction control section for inquiring the document creator about the undefined information recorded in the conversation record buffer to define the undefined information,
a input/output control section for controlling the communication with the document creator using graphic,
an input device for inputting the intention of the document creator into a computer system, and
a conversation record archive for storing therein the record of the defined conversation.
2. A formatted document creating system defined in the claim 1, wherein the input/output control section are to be controlled in GUI, the input device including any one or those combination of a character input device, a pointing device, and the output device including any one or those combination of a speech synthesizer, an acoustic sound producing device, and a graphic display.
3. A formatted document creating system defined in the claim 1, wherein said topicality control section is constructed to store information that has been defined by the document creator in a conversation record buffer as a case in said case database.
4. A formatted document creating system defined in the claim 1, wherein said information extracting section is constructed to write some nominations regarding proper information contents to the conversation record buffer with the reasonable degree information based on statistics when the extracted information regarding the proper information seems to be true.
5. A formatted document creating system defined in the claim 1, wherein said topicality control section is constructed to write some nominations regarding proper information to said conversation record buffer together with the reasonable degree information based on statistics when the deduced contents to be input in said conversation record buffer isn't decided only one thing.
6. A formatted document creating system defined in the claim 1, wherein said multimodal interaction control section is constructed to inquire the document creator by a speech, a GUI or a character input and define the information of sentence recorded in the conversation record buffer.

7. A formatted document creating system defined in the claim 5, wherein the multimodal interaction control section is constructed to inquire the document creator about information to be inquired in the conversation record buffer from the high nomination of a reasonable degree.

8. A formatted document creating system defined in claim 1, wherein said system further includes a telephone set that enables to do conversation in apart place and a sender-side telephone number acquiring device that acquire the sender-side telephone number and record it in the conversation record buffer.

9. A formatted document creating method used for recording conversation comprising:
a speech recognition step for recognizing speech of conversation,
an information extracting step for extracting information to be recorded according to the results of speech recognition,
a writing in step for writing in the conversation record buffer for transforming into formatted sentence including the extracted information and recording this as contents of conversation,
a case storing step for storing in a case database the above formatted sentence which may occur as the contents of conversation and includes many information,
a deducing information set step for deducing an undefined information on the basis of one item of information included in the sentence recorded the conversation record buffer section by referencing the cases stored in the case database and set it in the above conversation record buffer,
an information inquire renewing step for showing sentence including the undefined information recorded in the conversation record buffer by graphic to a document creator and inquiring the document creator about the undefined information recorded in the conversation record buffer to define the undefined information, and
a conversation record step for storing defined conversation record as sentences.

10. A formatted document creating method defined in the claim 9, wherein the information inquire renewing step is carried out through an input device that is any one or those combination of a speech synthesizer, an acoustic sound producing device, a character input device, a pointing device and a graphic display.

11. A formatted document creating method defined in the claim 9, wherein the case addition step is constructed to store information that is defined by the document creator in the conversation record buffer as a case in the case database additionally.

12. A formatted document creating method defined in the claim 9, wherein the writing in step is constructed to write some nominations regarding proper information contents to the conversation record buffer with the reasonable information based on statistics when the extracted information regarding the proper information seems to be true.

13. A formatted document creating method defined in the claim 9, wherein the deducing information step is constructed to write some nominations regarding proper information contents to the conversation record buffer with the reasonable degree information based on statistics when the deduced contents to be input in said conversation record buffer isn't decided only one thing.

14. A formatted document creating method defined in the claim 9, wherein the information inquire renewing step is constructed to inquire a document creator by a speech, a GUI or a character input and define information of sentence recorded in the conversation record buffer.

15. A formatted document creating method defined in the claim 9, wherein the deducing information set step is constructed to inquire the document creator about information to be inquired in the conversation record buffer from the high nomination of a reasonable degree.

16. A formatted document creating method defined in the claim 9, wherein the speech recognition step is carried out by recognizing conversation through telephone and said method further includes sender-side telephone number acquiring step that acquire the sender-side telephone number and record it in said conversation record buffer that is mentioned above.

17. A formatted document creating method defined in the claim 9, wherein the deducing information set step is constructed to refer a relevant case stored in the case database from the receiver-side telephone number recorded in the conversation record buffer and deduce other undefined information from an information of the sentence recorded in the conversation record buffer.

4/pst

Specification

System and method for creating formatted document
on the basis of conversational speech recognition

Field of the Invention

The present invention relates to documentation of the conversation such as formatted consultations, especially relates to the system and method for creating formatted document constructed by sentences of conversation on telephones at the same time.

Background of the Technology

If the contents of the conversation of consultation etc. are turned the document, it is useful to control user information and consultation contents. Conventionally, we recorded conversations by just leaving recording or making memo with a help. In the way of the former, we hear recordings again and turn the document by a help, but this requires great time and personal expenses to the work. On the other hand, in the latter one, there is a limit in the speed and we can't concentrate on the conversation for the need of making memo. Then, it is conceivable that we don't just record conversations but turn the document by using speech recognition section of computers. We can see this example in 6-253057 or 5-160925. However, there is not the proposal that prescribed about the method for creating formatted interaction document by using to be recorded according to the results of speech recognition.

Also, the accuracy of turning the document by a speech recognition that mentioned above is not often sufficient for practical use. However turning document by a speech recognition is not sufficient to turn the documents, it included essential information to make formatted record For example, in the conversation between the physician and the patient on the telephone, contents of conversation to be recorded are the information about the condition, symptom and time, because it may be the consultation with regard to sick and injury. In a various kinds of service industry, such as travel agencies, the purpose, number of persons, time, place, the cost, schedule etc. of travel become the contents of the conversation. In this

0936127-090501

On the other hand, thanks to the progress of the graphic user interface technology, it is general to display and input information in the computer by the combination of graphic display and pointing device. Furthermore, thanks to the progress of speech recognition and synthesizer technology, it is possible to get the information by speech with computer system and operator.

Description of the Invention

Specifically, the present invention is a formatted document creating system used for recording conversation and comprises a speech recognition device for recognizing speech of conversation, an information extracting section for extracting information to be recorded according to the results of speech recognition, a conversation record buffer for sentence including the extracted information and recording this as contents of conversation, a case database for storing the case which may occur as the contents of conversation and it includes many information, a topicality control section for deducing an undefined information on the basis of one item of information included in the sentence recorded in the conversation record buffer section by referencing cases stored in the case database, a multimodal interaction control section for inquiring the document creator about the undefined information recorded in a conversation record buffer to define the undefined information, a GUI control section for controlling the communication with the document creator using graphic, an input device for inputting the intention of the document creator into a computer system and a conversation record archive for

storing therein the record of the defined conversation.

We store therein a case which may occur as the content of conversation and includes many information. In the present invention, the case which may occur as the content of communication may be differ largely in some situations. However, in each situation, it is assumed that the contents of the conversation are limited in some degree. And, in each stored case, there are many information (to be recorded) that has important significance in recording conversation. We use these information and the relation in defining each information in the real conversation. In this way, creating the record of conversation, it is possible to show information which is right as the nominated information that composes formatted conversation record or has high probability that is right. Such as conversation record including an undefined information are showed on GUI which display on monitor of operator's computer by GUI control section.

Up to here, computer makes it at the same time during the conversation. On the inquiry to the document creator about the undefined information that recorded in a conversation record buffer, the document creator inputs the answer in a computer system by using a various input device. In other words, if an undefined information is right, we define it as it is, and if it isn't right, we select others right nominated information and define it or input right answer for oneself and define it. This is the work that needs to click the undefined information that is right and define, and it enables to create conversation record including all essential information in a short time without disturbing the flow of the conversation. A defined conversation record in a conversation record archive and arranged to be able to use it anytime and stored.

In the system for creating formatted document written in the claim 1, the present invention written in claim 2 is composed an input device including any one or those combination of a speech synthesizer, an acoustic sound producing device, a character input device, a pointing device, graphic display.

If it is able to input the answer in a computer system, any kinds of input device are OK. But from operability and accuracy, it is desirable that it is any or

2001年9月5日 15時15分

those combination of a speech synthesizer, an acoustic sound producing device, a character input device, a pointing device, and graphic display.

In the system for creating formatted document written in the claim 1, the present invention written in claim 3 is composed a topicality control section store information that is defined by the document creator in a conversation record buffer as a case in a case database. The study effect obtained from the work to define undefined information by the document creator makes use of creating conversation record that be carried after it.

In the system for creating formatted document written in the claim 1, the present invention written in the claim 4 is composed that in the case that information extracting about information in request ,an information extracting section writes some nominations regarding proper information contents to a conversation record buffer with the reasonable degree information based on statistics. When an information extracting section extracts information to be recorded from the results of speech recognition, it is turned documents as the defined information in the case that it is possible to be specified with the probability of 100%. In other words, in others case information extracting about information in request, an information extracting section writes some nominations regarding proper information contents to a conversation record buffer with the reasonable degree information based on statistics. In defining the undefined information, the document creator refers to this reasonable degree information.

In the system for creating formatted document written in the claim 1, the present invention written in the claim 5 is composed that in the case deducing of the contents to be input in a conversation record buffer isn't decided only one thing, a topicality control section writes some nominations regarding proper information contents to a conversation record buffer with the reasonable degree information based on statistics.

As mentioned above, a topicality control section is composed to write some nominations regarding proper information contents to a conversation record buffer with the reasonable degree information contents to a conversation record buffer

090501 090501 090501

with the reasonable degree information based on statistics. In the case deducing of the contents to be input in a conversation record buffer isn't decided only one thing, a topicality control section writes some nominations regarding proper information contents to a conversation record buffer with the reasonable degree information contents to a conversation record buffer with the reasonable degree information based on statistics. In this way, by using the reasonable degree information based on statistics decide the order of the contents of information that a user should select or narrow down it from information that in the results of turning the document by a speech recognition and information that a user inputs or decide. This enables to create the formatted contents of information efficiently. Inquiring the document creator about such as undefined information that was recorded in a conversation record buffer, define it. To the inquiry to the document creator about undefined information, a document creator inputs the answer into computer by using various input device. In other words, in the case there is a right answer in undefined information, select it and define, in the case there isn't, input right answer for oneself and define it. In doing these work, a document creator refers this reasonable degree information.

In the system for creating formatted document written in the claim 1, the present invention written in the claim 6 is composed that a multimodal interaction control section inquire a document creator by a speech, a GUI or a character input and define information of sentence recorded in a conversation record buffer By using means that is easy for the operator, define the information of sentence. Operability is more improved.

In the system for creating formatted document written in the claim 5, the present invention written in the claim 7 is composed A multimodal interaction control section inquire the document creator about information to be inquired in a conversation record buffer from the high nomination of a reasonable degree. It makes time to reach the right information short by inquiring to the document creator from nomination that has high possibility for the right answer.

In the system for creating formatted document written in the any of

09936127-090501

claim1~7, furthermore the present invention written in the claim8 includes a telephone set that enables to do conversation in apart place and a sender-side telephone number acquiring device that acquire the sender-side telephone number and record it in a conversation record buffer. A speech recognition section also can recognize a conversation speech through the telephone. A speech recognition section recognizes a speech of sender or receiver and then an information extracting section extracts information to be recorded from the results of speech recognition. A sender-side telephone number acquiring device gets a receiver-side telephone number and records it in a conversation record buffer. A receiver-side telephone number acquiring device gets a sender-side telephone number and records it in a conversation record buffer. It is possible to get some information about the speaker of telephone terminal and deduce others undefined information from the sentence information recorded in a conversation record buffer easily.

The second aspect of the present invention is a formatted document creating method used for recording conversation and comprises a speech recognition step for recognizing speech of conversation, an information extracting step for extracting information to be recorded according to the results of speech recognition, a writing in step for writing in a conversation record buffer for sentence including the extracted information and recording this as contents of conversation, a case storing step for storing in a case database the case which may occur as the contents of conversation and it includes many information, a deducing information set step for deducing an undefined information on the basis of one item of information included in the sentence recorded the conversation record buffer section by referencing cases stored in the case database and set it in an above conversation record buffer, an information inquire renewing step for showing sentence including undefined information recorded in a conversation record buffer by graphic to the document creator and inquiring the document creator about the undefined information recorded in a conversation record buffer to define the undefined information, and a conversation record step for storing defined

T05060 2273660

conversation record as sentences.

In the method for creating a formatted document written in the claim 9, the present invention in the claim 10 is composed that an information inquire renewing step including input device that any one or those combination of a speech synthesizer, an acoustic sound producing device, a character input device, a pointing device, a graphic display.

In the method for creating a formatted document written in the claim 9, the present invention written in the claim 11 is composed that including a case addition step to store information that is defined by the document creator in a conversation record buffer as a case in a case database additionally.

In the method for creating a formatted document written in the claim 9, the present invention written in the claim 12 composed that in the case that information extracting about information in request, a writing in step writes some nominations regarding proper information contents to a conversation record buffer with the reasonable information based on statistics.

In the method for creating a formatted document written in the claim 9, the present invention written in the claim 13 is composed that in the case deducing of the contents to be input in conversation record buffer isn't decided only one thing, a deducing information step writes some nominations regarding proper information contents to a conversation record buffer with the reasonable degree information based on statistics.

In the method for creating a formatted document written in the claim 9, the present invention written in the claim 14 is composed that an information inquire renewing step inquire a document creator by a speech, a GUI or a character input and define information of sentence recorded in a conversation record buffer.

In the method for creating a formatted document written in the claim 13, the present invention written in the claim 15 is composed that a deducing information set step inquire the document creator about information to be inquired in a conversation record buffer from the high nomination of a reasonable degree.

In the method for creating a formatted document written in the any of

09036127.090501

claim 9~15, the present invention written in the claim 16 is that a speech recognition step recognizes conversation through the telephone and this also includes sender-side telephone number acquiring step that acquire the receiver-side telephone number and record in a conversation record buffer.

In the method for creating a formatted document written in the claim 16, the present invention written in the claim 17 is composed that a deducing information set step refers a case stored in a case database from receive-side telephone number recorded in a conversation record buffer and deduces others undefined information from the sentence information recoded in a conversation record buffer.

Brief Explanation of the Drawings

Figure 1 is the block diagram of an embodiment of the system for creating a formatted document according to the present invention.

Figure 2 is the block diagram of an embodiment of the system for creating a formatted document in a conversation through the telephone according to the present invention.

Figure 3 is a diagram showing the contents of conversation between the doctor and the physicians.

Figure 4 is the diagram showing the contents of the conversation record.

The Best Mode for Carrying Out the Invention

This is a detailed explanation of the present invention that refers to desirable indicated an embodiment.

Figure 1 is a block figure that shows the entire constitution of an embodiment for creating a formatted document based on speech recognition of conversation in the present invention. As mentioned in the figure 1, the system for creating a formatted document based on speech recognition of conversation in this an embodiment comprises micro phone 1, speech recognition device 2, information extracting section 3, topicality control device 4, database 5, multimodal interaction control section 6, conversation record buffer 7, speech synthesizer 8, acoustic sound producing device 9, character input device 10, GUI control section 11, pointing

T05060 / 279E660

A speech recognition device 2 interprets a speech signal from a microphone 1 as a language speech and outputs character line or results of morpheme analysis (the text that is disassembled every word and add information such as the parts of speech) In this case, a speech recognition device 2 turned the document as defined information and writes it to a conversation record buffer as it is, in the case it is possible to be specified a speech signal as information with the probability of 100%. In other words, in others case information extracting about information in request, a speech recognition device 2 writes some nomination regarding proper information contents to a conversation record buffer with the reasonable degree information based on statistics. In defining the undefined information, the document creator can make more appropriate judgment by referring this reasonable degree information.

And also, a multimodal interaction control section 6 collects information from the document creator, a speech recognition device 2 transforms information that the document creator offered by a speech into character line and send to a multimodal interaction control section 6.

As for "the purpose of the travel", in the case there are words (information) such as a honeymoon, a recreation of companies, a graduation trip, a private trip, a

group trip, a business trip, an inspection trip, a parent and child trip, summering, swimming, skiing, golf, scuba diving, theatergoing, watching, participation to an event, an information extracting section 3 extracts this as “information to be stored as a record” and records in a conversation record buffer. As for “number of people”, combines words that represents number with “ninn (Unit for number of people)” and in the case it includes the words that represents two person such as “a couple” and “a newly married couple”, an information extracting section 3 extracts this as “information to be stored as a record” and records in a conversation record buffer 7.

A topicality control section 4 deduces the contents to be input as others information over referring a database 5 from the information showed in a conversation record of a conversation record buffer 7 and writes to a conversation record buffer 7. This time in the case a deducing isn't decided only one thing, a topicality control section writes many nominations about the information with reasonable degree value in a conversation record buffer 7. The reasonable degree value is calculated based on the information written in a database 5, using the method of “Beise”. A case database 5 stores cases to deduce the contents of others information from the information that was given in a conversation record buffer. In practice, the relationship of contents of each information is stored as a case about information that is defined by the document creator in a conversation record buffer. With the example in the counter of the travel agency that is mentioned before, a case is many stored “the travel schedule” is three days ~two weeks, “a number of people” is two, “the destination” is Hawaii, the Mediterranean, west coast of the United States, mainly travel abroad, “the airline company” is Japanese company such as JAL or ANA and use business class and stay at the ocean-view suit even if “the cost” is a little high, “the payment” is cash and advance about information, “a honeymoon”.

Under this situation, in spite of be recorded “a honeymoon”, it is assumed to recognize that “number of people” is three, “the destination” is Atami. In this case, as three people contradicts under the words, “a honeymoon” and “number of people” a multimodal interaction control section 6 displays “two people” as first nomination

T05060 27 090501

and "three people" as second nomination with the reasonable degree information and inquires to the document creator. In this case, the former reasonable degree point is 1.000 and the latter one is 0.000, because a number of people is "two" in all cases. After the document creator check it to the customer, if "two people" is right, the document creator clicks it and defines and "three people" is right, the document creator selects it and defines. For example, even if they are newly married, if there is a child in a couple, it may be happen to go "a honeymoon" with three people.

Or the recognition of "a honeymoon" is actually mistake and the customer utters "shinjinn kennsyuu ryokou" as "shinn-kenn-ryokou" shortly in conversation, it may occur that a speech recognition device 2 misunderstands this as "a honeymoon". In this case, the document creator corrects the part of "a honeymoon" or "shinn-konn-ryokou" as "shinn-kenn-ryokou" by using an input device 10 of a keyboard etc and defines it. If it is "a new face training trip", it does not contradict with the destination, Atami.

Furthermore, in the use early period stage of the system, the relationship between the assumed information is written by a system designer, because there isn't the accumulation of the case by study.

A topicality control section 4 stores information that the document creator defines in a conversation record buffer as a case to give a reasonable degree information in a database 5. A multimodal interaction control section 6 reads a conversation record buffer 7 and gathers information by inquiring to the document creator about the information that haven't defined the contents. In this time, in the case the interaction by a speech is judged proper, inquiring by a speech starts. If it isn't proper, gathering information by a GUI or a character input device 10.

With a request of the document creator, a multimodal interaction control section 6 can show the contents of a conversation record buffer 7 to the document creator through a graphic display 13 or a speech synthesizer 8 and an acoustic sound producing device. Especially, with a request of the document creator, a multimodal interaction control section 6 can show the turning the document results of a speech recognition device 2 in a conversation record buffer 7 on a

09036127 090501

graphic display 13.

In gathering interaction information from the document creator, in the case the choice of user's utterance is limited, a multimodal interaction control section 6 can make recognition of a speech more accurate by sending choices to a speech recognition device 2 beforehand. For example, in the case the customer hopes the travel to Okinawa, a multimodal interaction control section 6 sends the place name and its pronunciation of Okinawa to a speech recognition device 2 beforehand. Like this, when the customer even utters the lodging, "Kunigamigunn-oogimimula", the probability that recognizes correctly is raised.

A conversation record buffer 7 stores the contents of each formatted interaction information. In the case the contents aren't defined(in the case it is undefined information), a nomination list about the contents are given. There are a few cases that reasonable degree are given to each nomination. Also, a conversation record buffer 7 stores the turning the document results in a speech recognition section 2.

A speech synthesizer 8 can transform text into speech signal about message to the document creator from a multimodal interaction control section 6.

An acoustic sound producing device 9 transforms a speech signal from an acoustic sound producing device 8 into an acoustic. A character input device 10 of a keyboard transforms type input from the document creator into a signal to a multimodal interaction control section 6.

A GUI control section 11 displays choices input request from a multimodal interaction control section 6 on a graphic display 13 and conveys choices by a pointing device 12 of the document creator to a multimodal interaction control section 6.

A pointing device 12 conveys choices of the document creator(for example, a mouse click at a position) to a GUI control section. A graphic display 13 does input request from a multimodal interaction control section 6 and shows contents of a conversation record buffer 7 based on requests of the document creator. A conversation record archive 14 stores the contents of a conversation record buffer 7

090501 22:49:08

with a request of the document creator.

In this way, the present invention can create a formatted interaction document by using the information in the tuning document results by a speech recognition. By using the reasonable degree information based on statistics, decide the order of the contents of information that a user should select or narrow down it and it enables to create the formatted contents of information efficiently.

Figure 2 is the block diagram of an embodiment of the system for creating a formatted document in a conversation through the telephone that relates the present invention.

A conversation or a consultation through the telephone are important means of communication even in the internet developed present day. For example, in the case of the old who can't even go outside, it is difficult to learn how to operate computers and buy essential equipments. Then in the future, it is assumed that medical treatment consultation is carried out through the telephone. In that case, it takes it granted that doctors carry out conversation through the telephone proper and the contents of the consultation and prescription of medicine and others instructions have to be stored as a record. If the medical treatment is face-to-face, it doesn't be a problem that doctors take time to write in a medical report in apply to the necessity. However, in the medical treatment through the telephone, the development of the system that can create the conversation record in real time, because the physicians tend to be anxiety if the conversation ceases or a long time.

This embodiment is the one that meet such as request, basically set a telephone 15 instead of a microphone 1 in the system of figure 1 mentioned above and add a sender-side telephone number acquiring device 16 for getting a receiver-side telephone number and recording in a conversation record buffer 7.

In this embodiment, a speech recognition device 2 is able to compose that it can switch to recognize speech that is only a sender-side, or a receiver-side, or both of them in the conversation through the telephone. So even if it takes to a little time, doctors repeat physicians' words and be able to store only doctors' words as a conversation records. Also in the situation, it isn't necessary to create a

09050127-090501

A sender-side telephone number acquiring device 16 gets a receiver-side telephone number and records it in a conversation record buffer 7. It is possible to get various kinds of information about the speaker of telephone terminal. For example, it is possible to get information such as name, sex, age, insurance, disease record, treatment record etc. and to deduce others undefined information from the sentence information recorded in a conversation record buffer easily. Naturally, it is able to be composed to get the same information from a database accumulated in a computer of the document creatorside by using the receiver-side telephone number get from the conversation.

Next is explanation about the system for creating a formatted document that is assumed the medical treatment through the telephone. At first, the operator writes mutual relationship between the information that is assumed in a case database 5. It is because there isn't the accumulation of the case by study in early use of period stage of the system.

NO. 4908 P. 17

relationship become high as a reasonable degree. Similar to others disease, various cases including many information to be recorded are accumulated.

The consultation through the telephone between the doctors and physicians are recorded by using this system. Figure 3 is the contents of the conversation between physicians and patients. In this enforcement, transmission and receive of the telephone are both turned the document and recorded.

A speech recognition device 2 outputs all transmission and receive signal of a telephone 5 to an information extracting section 3 after a speech recognition device 2 changes it into a speech signal. In the memory in an information extracting section 3, words that mentioned above are registered as information to be recorded, and in turning documents sentence by a speech recognition device 2 of A1~A9, it includes information that decided to be recorded in A3~A8. On the other hand, in turning documents sentence by a speech recognition device 2 of B1~B9, it includes information that decided to be recoded in B2~B4, B6. In a table, underline is marked in information that decided to be recorded.

An information extracting section 3 records the results of turning down the documents that includes information like this in a conversation record buffer 7, "What's happen? there is a fever and the cold and nearly 40 degree in a thermometer", "Is there any outstanding symptom? There is a pain in the joint and in the oto "How about a cough and a sneeze?", "Nothing, but there is a pain at the back of the lung.", "How about snot?", "Nothing", "When did you have a fever?", "From the last night, and there is a pain from this morning.", " It's a cold.", "Please rest warmly, and take medicine for a fever on the market." Here, underline is marked in a part that different from the conversation in real and change there bold.

A topicality control section 4 changes "There is a pain in the throat and the back of the chest in coughing" that recorded as a case in a case database 5 into "a throat" as a nomination of "The oto" and renews the record in a conversation record buffer 7, and also changes a case "there is a nearly 40 degree fever and a cough and a sneeze" into "a cough" as a nomination of "a cough" and renews the record in a conversation record buffer 7.

T05060 22F0650

A multimodal interaction control section 6 displays on a GUI of monitor sentences such as "What's happen?" "There is a fever and the cold and nearly 40 degree in a thermometer", "Is there any outstanding symptom?" "There is a pain in the joint and in the throat" "How about a cough and a sneeze?" Nothing, but there is a pain at the back of the chest." "How about snot? Nothing" "When did you have a fever? From the last night, and there is a pain from this morning." "It's a cold." "Please rest warmly, and take medicine for a fever on the market" under the control of a GUI control section. Of course, instead of a GUI, it's possible to inquire to the document creator by a speech using a speech synthesizer 8 and an acoustic sound producing device 9.

The document creator selects the right one about information that is inquired defines it by using a character input device 10 and a graphic display 13 of monitor combined with a pointing device 12. In the acceptable enforcement that is showed, a nomination of the undefined information is only one, but in the case that the recognition accuracy in a speech recognition device 2 is low and there are many nominations, it's name is similar, the nominations are more than two. Then it is mentioned that it is desirable to add the reasonable degree information to each nomination.

Furthermore, from the defined record of the conversation, a multimodal interaction control section 6 writes a formatted document that includes each information again and records in a conversation record buffer 7. In this enforcement, each sentence such as "There is a nearly 40 degree fever and the cold.", "There is a pain in the joint and the throat.", "There is a ace in the back of the chest.", "There was a fever from the last night.", "There is a pain from this morning.", "It's a cold.", "Please rest warmly.", "Please take medicine for a cold.", are recorded as defined information. And this conversation record is recorded in a conversation record archive 14 and stored in a case database 5 as a case (figure 4) that includes many information to be recorded. Here, when the patients make a call, a sender-side telephone number acquiring device 16 can get information in the patients note by getting receiver-side telephone number. Of course, it is possible to hear from the

patients directly.

090501 090501

What is claimed is:

1. A formatted document creating system used for recording conversation comprising,
 - a speech recognition device for recognizing speech of conversation,
 - an information extracting section for extracting information to be recorded according to the results of speech recognition,
 - a conversation record buffer for sentence including the extracted information and recording this as contents of conversation,
 - a case database for storing the case which may occur as the contents of conversation and includes many information,
 - a topicality control section for deducing an undefined information on the basis of one item of information included in the sentence recorded in the conversation record buffer section by referencing cases stored in the case database,
 - a multimodal interaction control section for inquiring the document creator about the undefined information recorded in the conversation record buffer to define the undefined information,
 - a input/output control section for controlling the communication with the document creator using graphic,
 - an input device for inputting the intention of the document creator into a computer system, and,
 - a conversation record archive for storing therein the record of the defined conversation.
2. A formatted document creating system defined in the claim 1, wherein the input/output control section are to be controlled in GUI, the input device including any one or those combination of a character input device, a pointing device, and the output device including any one or those combination of a speech synthesizer, an acoustic sound producing device, and a graphic display.
3. A formatted document creating system defined in the claim 1, wherein said topicality control section is constructed to store information that has been defined by the document creator in a conversation record buffer as a case in said case

T050501 050501 050501

database.

4. A formatted document creating system defined in the claim 1, wherein said information extracting section is constructed to write some nominations regarding proper information contents to the conversation record buffer with the reasonable degree information based on statistics when the extracted information regarding the proper information seems to be true.

5. A formatted document creating system defined in the claim 1, wherein said topicality control section is constructed to write some nominations regarding proper information to said conversation record buffer together with the reasonable degree information based on statistics when the deduced contents to be input in said conversation record buffer isn't decided only one thing.

6. A formatted document creating system defined in the claim 1, wherein said multimodal interaction control section is constructed to inquire the document creator by a speech, a GUI or a character input and define the information of sentence recorded in the conversation record buffer.

7. A formatted document creating system defined in the claim 5, wherein the multimodal interaction control section is constructed to inquire the document creator about information to be inquired in the conversation record buffer from the high nomination of a reasonable degree.

8. A formatted document creating system defined in the any of claim 1~7, wherein said system further includes a telephone set that enables to do conversation in apart place and a sender-side telephone number acquiring device that acquire the sender-side telephone number and record it in the conversation record buffer.

9. A formatted document creating method used for recording conversation comprising,

a speech recognition step for recognizing speech of conversation,

an information extracting step for extracting information to be recorded according to the results of speech recognition,

a writing in step for writing in the conversation record buffer for sentence

0936127-090501

including the extracted information and recording this as contents of conversation,

a case storing step for storing in a case database the case which may occur as the contents of conversation and includes many information,

a deducing information set step for deducing an undefined information on the basis of one item of information included in the sentence recorded the conversation record buffer section by referencing the cases stored in the case database and set it in the above conversation record buffer,

an information inquire renewing step for showing sentence including the undefined information recorded in the conversation record buffer by graphic to a document creator and inquiring the document creator about the undefined information recorded in the conversation record buffer to define the undefined information, and

a conversation record step for storing defined conversation record as sentences.

10. A formatted document creating method defined in the claim 9, wherein the information inquire renewing step is carried out through an input device that is any one or those combination of a speech synthesizer, an acoustic sound producing device, a character input device, a pointing device and a graphic display.

11. A formatted document creating method defined in the claim 9, wherein the case addition step is constructed to store information that is defined by the document creator in the conversation record buffer as a case in the case database additionally.

12. A formatted document creating method defined in the claim 9, wherein the writing in step is constructed to write some nominations regarding proper information contents to the conversation record buffer with the reasonable information based on statistics when the extracted information regarding the proper information seems to be true.

13. A formatted document creating method defined in the claim 9, wherein the deducing information step is constructed to write some nominations regarding proper information contents to the conversation record buffer with the reasonable

P. 23 NO. 4908

17. A formatted document creating method defined in the claim 9, wherein the deducing information set step is constructed to refer a relevant case stored in the case database from the receiver-side telephone number recorded in the conversation record buffer and deduce other undefined information from an information of the sentence recoded in the conversation record buffer.

THE UNIVERSITY OF CHICAGO

THE UNIVERSITY OF CHICAGO

THE UNIVERSITY OF CHICAGO

1 / 4

Figure 1

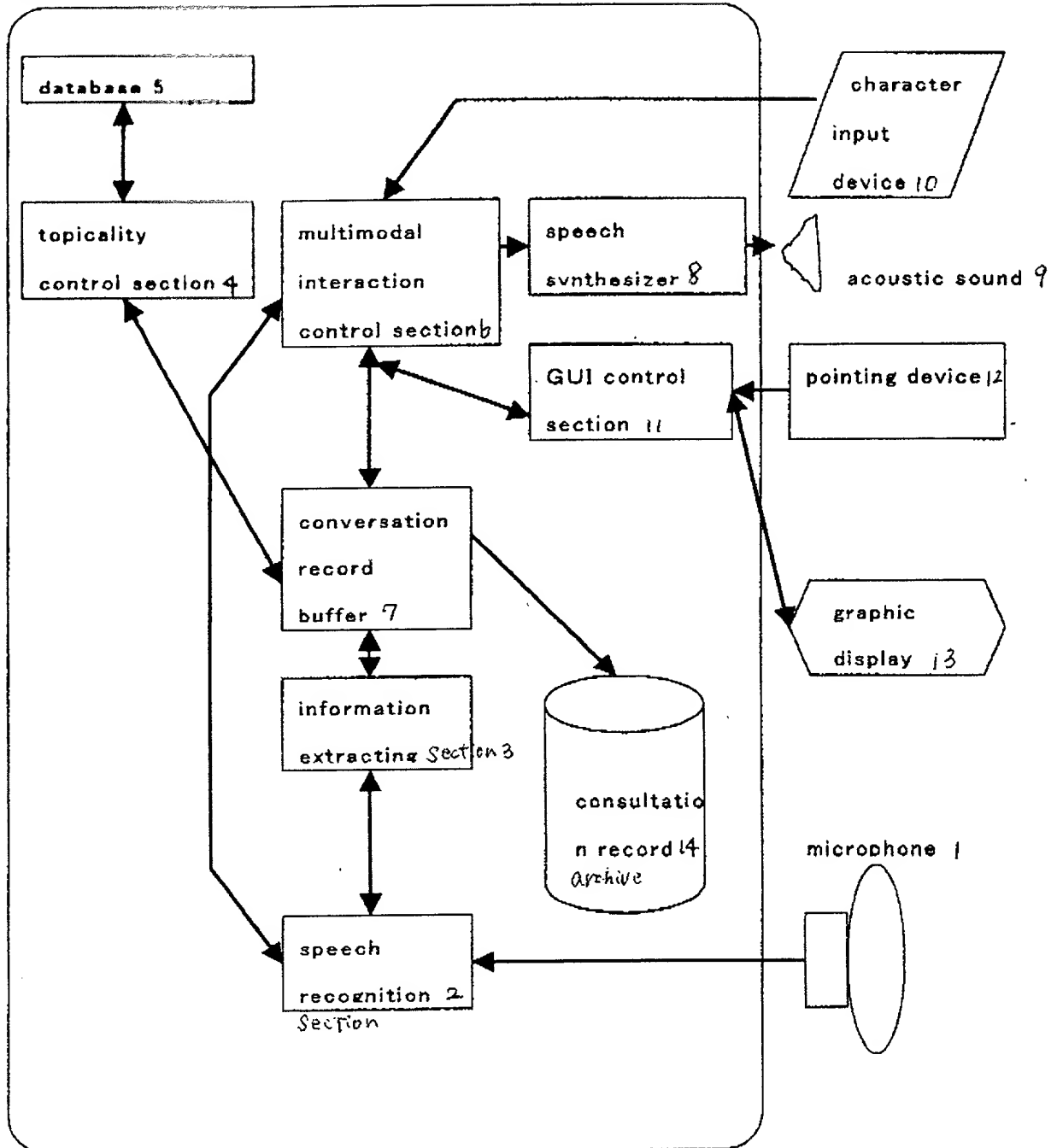
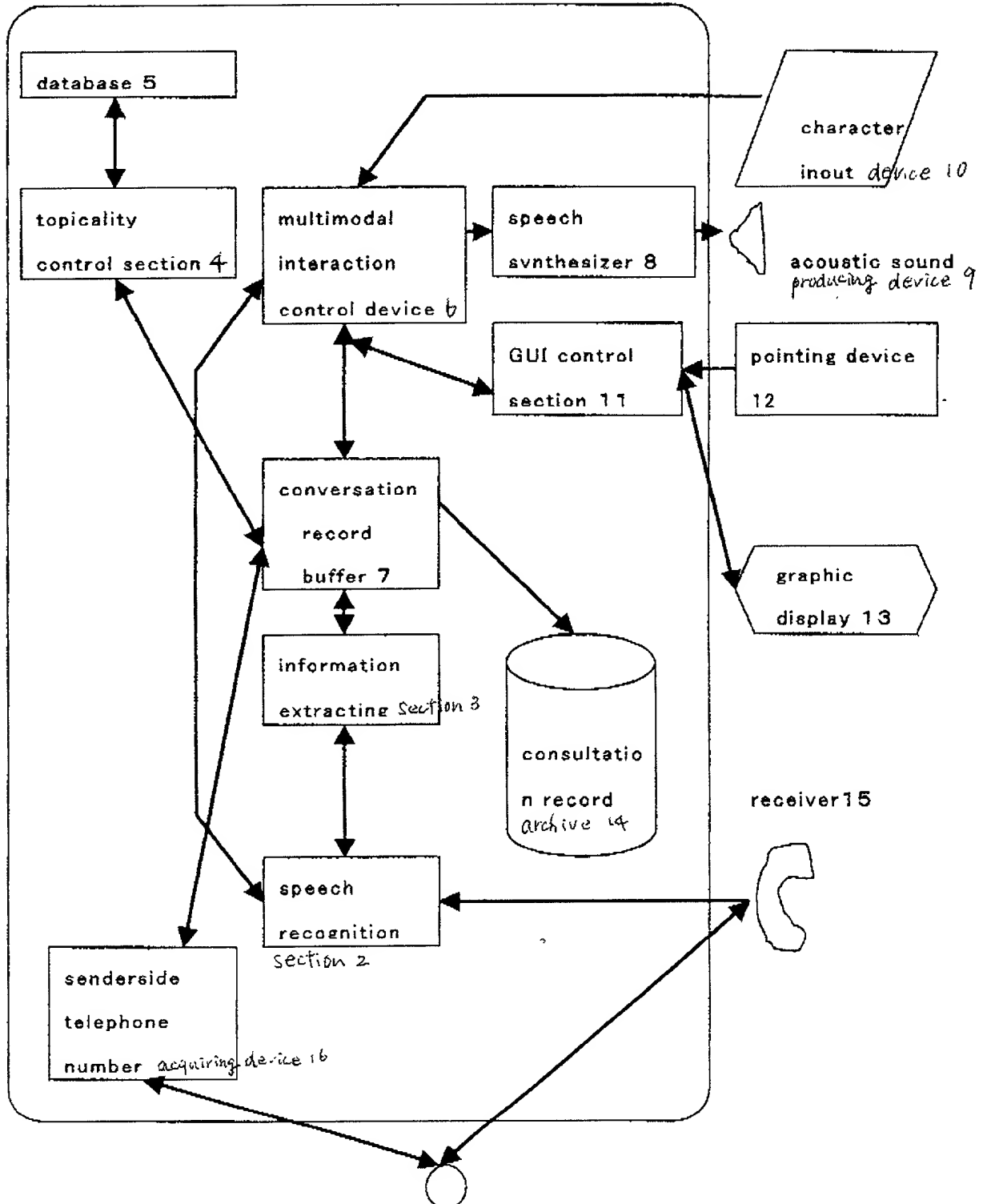


Figure 2



3/4

Figure 3 Conversation between the physicians and the patients

The physicians	The patients
A1: Hello, this is Nishimori, Nishimori hospital.	
	B1: I am Sato
A2: What's happen?	
	B2: There is a nearly <u>"40" degree in a thermometer and the cold.</u>
A3: Is there anything outstanding <u>symptoms</u> ?	
	B3: There is a <u>pain in the joint and the throat.</u>
A4: How about <u>a cough or a sneeze</u> ?	
	B4: Nothing, but there is a <u>pain in the back of the lung.</u>
A5: How about nausea?	
	B5: Nothing.
A6: <u>When</u> did you have a cold?	
	B6: It is from <u>the last night</u> and a <u>pain of the joint</u> is from <u>this morning.</u>
A7: It's <u>a cold.</u>	
A8: Please <u>rest warmly</u> and take <u>medicine for a cold</u> on the market.	
	B7: OK
A9: Then, take care.	

0936127, 090501

Figure 4 the contents of the conversation record

The name of the patient Ichiro Sato 47 year old male	tel. : 0 3 - 3 5 9 3 - 6 1 6 8 add. : 1-12-14, tranomonn, minoto-ku, tokyo work : patent attorney card : AMEX3761-197957-80018 social insurance number : PXY1987-3478 disease record : 11.20.1998 a cold treatment record : 3days to stay hospital
Symptom	"There is a 40 degree fever and the cold." "There is a pain in the joint and the throat" "There is a pain in the back of the lung." "There is a fever from the last night." "The pain in the joint is from this morning."
Diagnosis	"A cold"
Treatment	"Please rest warmly" "Please take medicine for a cold"

09/936127 090501

OSTRAGER CHONG FLAHERTY & ONORIO
Registered Patent Attorneys -- New York & Hawaii, USA

Atty Dkt #: NAA-CAI-P25

DECLARATION FOR U.S. PATENT APPLICATION & POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below), or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a United States patent is sought on the invention entitled:

SYSTEM AND METHOD FOR CREATING FORMATTED DOCUMENT ON THE BASIS OF CONVERSATIONAL SPEECH RECOGNITION

the specification of which is attached hereto, unless the following box is checked:

[X] was filed on March 6, 2000 ~~1999~~ as ~~US Patent Application~~ PCT/JP00/01339 or PCT International Application PCT/JP00/01339 and was amended on January 1, 2001 (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, and as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim the benefit under Title 35, United States Code, Section 119 of any foreign application(s) for patent or inventor's certificate listed below, and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s):

Priority Claimed

<u>58027/1999</u> (Appln. #)	<u>Japan</u> (Country)	<u>5 March 1999</u> (Day/Month/Year Filed)	[X] [] Yes No
<u>58028/1999</u> (Appln. #)	<u>Japan</u> (Country)	<u>5 March 1999</u> (Day/Month/Year Filed)	[x] [] Yes No
<u> </u> (Appln. #)	<u> </u> (Country)	<u> </u> (Day/Month/Year Filed)	[] [] Yes No

I hereby claim the benefit under Title 35, United States Code, Sections 119(e) and 120 of any United States patent application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

(Appln. #)	(Day/Month/Year Filed)	(Status: patented, pending, abandoned)
(Appln. #)	(Day/Month/Year Filed)	(Status: patented, pending, abandoned)

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the U.S. Patent and Trademark Office connected therewith: Glenn F. Ostrager, Reg. No. 29,963; Leighton K. Chong, Reg. No. 27,621; Dennis M. Flaherty, Reg. No. 31,159; Dara L. Onofrio, Reg. No. 34,889; Joshua S. Broitman, Reg. No. 38,006; Manette Dennis, Reg. No. 30,623. (6)

[] Please address all correspondence to Attorney: _____ at the Firm of Ostrager Chong Flaherty & Onofrio, P.C., 300 Park Avenue, 25th Fl., New York, N.Y. 10022-7402, Tel: (212) 826-6565.

[x] Please address all correspondence to Attorney: Leighton K. Chong at the Firm of Ostrager Chong Flaherty & Onofrio, P.C., 841 Bishop Street, Suite 1200, Honolulu, HI 96813-3908, Tel: (808) 533-4300.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Dated: 30 August, 2001

INVENTOR (FIRST NAMED):

1-00
Tadamitsu Ryu
 Name: Tadamitsu RYU
 Residence/Post Office Address: Asia Height 201 5-5
Senzoku 3-chome Taitou-ku
Tokyo 111-0031 Japan
 Citizen of: Japan

JPX